

1                                   **“HANGING COVER SUPPORT APPARATUS”**

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3                                   **FIELD OF THE INVENTION**

4                   The present invention generally relates to apparatus to suspend and  
5 support a hanging cover using tension members extending to a lower edge of the  
6 cover so as to relieve stress on the cover and more particularly to hanging supports  
7 at an upper edge of the hanging cover.

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9                                   **BACKGROUND OF THE INVENTION**

10                  Hot tubs or spas have long been used by people for relaxation and  
11 physical therapy. It is desirable that dirt, leaves and other types of debris be  
12 prevented from falling into the water. Additionally, since spas are heated for normal  
13 use, it is important to reduce the heat lost from the heated water to the cooler  
14 surroundings not only to conserve energy, but to save on energy costs to the user.  
15 Accordingly, a spa cover is used and is generally sized and configured to completely  
16 cover the open area of the spa. To minimize heat loss, the covers are typically  
17 constructed of an insulating material, such as foam, and are covered by a water-  
18 resistant material or fabric such as vinyl. The covers are commonly partitioned into  
19 two sections joined by a stitched seam forming a hinge so as to allow the cover to  
20 fold in half and, thereby, facilitate handling and storage.

21                  Damage to the spa cover, and specifically the stitching, can occur over  
22 time due to stress from the removal and supporting processes. The cost of repair to  
23 a torn seam can often exceed the cost of a new cover.

1                   Contributing to the damage to the cover are devices used for lifting spa  
2 covers which generally incorporate a means for supporting the spa cover when  
3 removed from the spa. Typically, the spa cover folds over a crossbar of the lifting  
4 device and once displaced from the spa, the cover is supported by hanging the  
5 cover over the crossbar by the hinge adjacent the spa. The full weight of the spa  
6 cover on the hinge results in stress to the stitching in the hinge and decreases the  
7 service life of the spa cover.

8                   Many spa cover lifting and supporting devices utilizing crossbars are  
9 known in the art. US patent 5,131,102 to Salley et al teaches a device wherein a  
10 crossbar is supported by two side arms and is pivotally attached to a base. A spa  
11 cover folds over the crossbar, and the crossbar, along with the supported cover, is  
12 pivoted clearly away from, and adjacent the spa. The spa cover hangs by its fabric  
13 hinge over the crossbar in a near vertical position adjacent and to the side of the  
14 spa.

15                  Others use a discontinuous crossbar, simply to members which  
16 protrude only partially across the cover. For example, US patent 5,517,703 to  
17 Ouelette, US patent 5,566,403 to Black et al, US patent 5,584,081 to Ouelette, and  
18 US patent to 5,634,218 to Ouelette are typical of this form of lifter. Nevertheless,  
19 each of these style of prior art lifters still rely on hanging the cover by its hinge when  
20 lifted and set aside

21                  Others have attempted to support spa covers in alternate methodology  
22 with relying on the hinge seam. For example, US patent 4,991,238 to Forrest does  
23 not incorporate a crossbar, and instead teaches a device comprising a support

1 frame adjacent to a spa onto which a folded spa cover may be slid in coplanar  
2 relationship to the top of the spa. Once the cover is received, the frame rotates to  
3 lower the edges of the cover and acts like a cradle to support the cover. Another  
4 form of cover removal apparatus is in US patent 5,819,332 to Perry which teaches  
5 permanently connecting pivoting side arms to the cover adjacent the cover's hinge  
6 and that pivots to the spa. Further, a back rack is pivotally connected between one  
7 peripheral edge of the cover and the adjacent side of the spa so as to rotate  
8 downwardly with the cover and supports the weight of that side of the cover.

9           Accordingly, there is a need for a support apparatus adapted to a  
10 simple crossbar lifting apparatus which alleviates stress placed on the cover or cover  
11 hinge when the cover is supported in a near vertical position and this is easy to use.  
12 The apparatus should also be non-invasive to the spa cover, be easy to install, low  
13 cost, adjustable and adaptable to the most commonly available spa lifting apparatus.

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## SUMMARY OF THE INVENTION

A support apparatus for a cover is adapted for hanging covers without subjecting the fabric to excessive stress. In a preferred embodiment of the invention as applied to a cover having two surfaces foldable in half at a hinge and supported over a crossbar, brackets are provided for engaging lower peripheral edges of the two surfaces and the brackets are connected or suspended from the crossbar using tension members such as straps so as to suspend or lift the hinge clear of the crossbar. Note that herein the term crossbar refers to continuous and discontinuous members which extend entirely or partially across a cover.

In one embodiment, the apparatus comprises: at least one engaging means having at least one "T"-shaped support member for engaging first and second peripheral edges of the cover when the cover is hung in a lifted, substantially upright position. Further, one or more tension means are adapted to connect between the crossbar and the engaging means. The length of the tension means ensures that the hinge or other fabric connector at the top of the cover is positioned above the crossbar and thus remains un-stressed.

In combination with a conventional cover lifting device, a folding cover is supported over a crossbar, the crossbar being supported by two side arms rotatable about pivots. The side arms extend only so far as to position the crossbar parallel to and intermediate of the cover edges and short of the hinge. Preferably straps extend from the crossbar and along the cover to a bracket affixed to an edge of the cover. The cover lifter rotates the crossbar and cover to a lifted, substantially upright position. The weight of the cover is supported by the straps connected

1 between the crossbar and the bracket, rather than by a contact point of the crossbar  
2 to the cover's hinge.

3 Accordingly, in a broad aspect, apparatus for supporting a cover  
4 comprises: engaging means for supporting and releasably engaging first and second  
5 planer surfaces of the cover adjacent peripheral edges; and tension means  
6 connected between the crossbar and the engaging means for supporting the cover  
7 with a hinge of the first and second planer surfaces being spaced above the  
8 crossbar in a substantially stress free state.

9 Preferably, the cover is a spa cover comprising two halves separated  
10 by a hinge seam and preferred tension means are nylon straps with "T"-shaped  
11 brackets engaging the lower peripheral edges of the cover. The straps are  
12 adjustable to permit adjustment and adaptation to the most commonly available spa  
13 cover lifting apparatus. Additionally, the brackets are removeably affixed to one of  
14 the surfaces of the cover so as to better retain the support apparatus to the cover  
15 when the apparatus is not actively supporting the cover.

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1                                    BRIEF DESCRIPTION OF THE DRAWINGS

2                                    Figure 1 is a perspective, partial view of a damaged fabric hinge of a  
3 cover hung over a crossbar in the fashion of the prior art

4                                    Figure 2a is a top view of a tension strap and bracket embodiment of  
5 the present invention, the apparatus being adapted to a conventional cover lifting  
6 device;

7                                    Figures 2b – 2e are sequential views of the lifting and support of a  
8 cover having two sides according to the embodiment of Fig. 2a.

9                                    Figure 2b is a partial side view of the cover in a resting position;

10                                  Figure 2c is a partial side view of the cover being folded in half for  
11 lifting by the lifting device;

12                                  Figure 2d is a partial side view of the cover folded in half to  
13 sandwiching the crossbar therebetween;

14                                  Figure 2e is a partial side view of the cover in a lifted and supported  
15 position adjacent one side of the spa, the two sides of cover being supported from  
16 lower peripheral edges using the bracket and tension strap of Fig. 2a;

17                                  Figure 3 is a side view of the two side of the cover of Fig. 2e illustrating  
18 the bracket and the tension strap and better illustrating the support of the cover  
19 without stress being imposed on the hinge;

20                                  Figure 4a is a side view of a bracket embodiment of the engaging  
21 means of the present invention, illustrating the tension connector and the base  
22 having angled portions;

23                                  Figure 4b is a top view of the bracket of Fig. 4a;

1                   Figure 5 is a perspective view of a tension strap and bracket according  
2 to Fig. 2a, 4a, and 4b illustrating a tension strap connected to a crossbar and having  
3 an adjustable length;

4                   Figure 6a is a close up partial side view of the bracket according to Fig.  
5 2d, just prior to the two sides being folded and illustrating the interaction of the sides  
6 peripheral edges and the bracket;

7                   Figure 6b is a close up of another embodiment of a bracket which is  
8 optionally and releasably secured to one side of the cover;

9                   Figure 7a-7d are several alternate embodiments of the tension means  
10 and engaging means including two pairs of tension and engaging means, two  
11 tension means and one engaging means; a mesh style tensions means and two pair  
12 of tension and engaging means at the lateral edges of cover respectively. For  
13 covers having folded planer surfaces, one has been omitted for clarity;

14                  Figures 8a and 8b are side views illustrating a prior art lifter and single  
15 side planer cover suspended from a hanging connector; and

16                  Figure 8c is an embodiment of the present invention adapted to the  
17 crossbar and single side planer cover of Figs. 8a and 8b.

18                  Figures 9a-9c are side views of alternate embodiments of the engaging  
19 means, including a base without contouring or bent away distal ends; a base with  
20 one distal end bent away; and a base with two distal ends bent away.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to Fig. 1, weight of a cover can be supported from some form of crossbar through fabric tabs or a fabric hinge between adjacent sides of a multi-surface cover. Over time, the fabric or seams securing the fabric to the cover's surfaces can tear under the stress of the weight of the cover surfaces. The present invention relieves the stress on such fabric components.

Covers are typically displaced between two positions, a resting position covering some area or opening of particular interest, and a supported position displaced from the opening. Fabric covers are typically supported for the protection of the cover or the surrounding area.

Turning to an embodiment of the invention and with reference to Figs. 2a – 2e, a fabric or fabric-encased cover 10 is illustrated resting in place over an area of interest, such as a hot tub or spa 11. The cover is preferably supported through means engaging at a lower portion or beneath the cover rather than by hanging the cover from damage-susceptible supports, such as a fabric connector or hinge fastened by a seam to the cover. As illustrated, the present invention is described in the context of a cover 10 for a spa. It is understood, however that the support apparatus is of broad application and works as well for supporting a cover or lid of other areas of interest such as containers in which the cover is better served by supporting them with means other than by hanging.

In Figs. 2a and 2b, support apparatus 15 for the cover 10 comprises cover engaging means 16 adapted for connection and suspension from a structural crossbar 18 using tension means 17 which are members capable of accepting tension



1 without substantial stretch or extension; compression capability not being required. As  
2 shown, the cover 10 has first and second planer surfaces 19a,19b foldable about a  
3 hinge 20 and having opposing peripheral edges 21a,21b extending substantially  
4 parallel to the hinge. The engaging means 16 support the cover without imparting  
5 significant tension to the fabric of the cover.

6 A conventional lifting device 30 is mounted to a side of the spa 11 and  
7 rotates about a pivot 31 which is arbitrarily shown as being adjacent the second planer  
8 surface 19b. The crossbar 18 is supported by two side arms 32. The side arms 32  
9 have a length sufficient so as to space the crossbar 18 away from the peripheral edge  
10 21b towards and adjacent to but spaced short from the hinge 20. Accordingly, the  
11 effective length of the tension means 17 and engaging means 16 have a length shorter  
12 than the distance between the hinge 20 and the peripheral edge 21a or 21b. Tension  
13 means 17 include flexible and non-flexible members. Of the flexible members,  
14 examples include straps such as netting, polypropylene, nylon, and aircraft cable.  
15 Examples of non-flexible members can include slender rods and strapping.

16 With reference to Figs. 2c – 2e, the first planer surface 19a folds (Fig. 2c)  
17 at the hinge 20 and over the crossbar 18 so that ultimately the first planer surface 19a  
18 lies on top of the second planer surface 19b (Fig. 2d). The crossbar 18, tension means  
19 17 and engaging means 16 are sandwiched between the first and second planer  
20 surfaces 19a,19b.

21 As shown in Fig. 2e, once the lifting device 30 is actuated, the cover 10  
22 is supported by the crossbar 18. Using an embodiment of the present invention, the  
23 cover 10 is supported by the engaging means 16 at the cover's peripheral edges

1 21a,21b. Above the engaging means 16, the weight of the cover 10 is transferred  
2 through the tension means 17 to the crossbar 18, the hinge remaining in a  
3 substantially unstressed state.

4 With reference to Fig. 3, the lifter device 30 and spa 11 have been  
5 omitted for clarity illustrating, in isolation, the hanging cover 10 and support  
6 apparatus 15. The engaging means 16 bears the entire weight of the cover 10  
7 through support of both of the cover's first and second planer surfaces 19a,19b and  
8 the tension means 17. The tension means 17 is sandwiched between and interferes  
9 minimally with the two planer surfaces 19a,19b.

10 As shown in Figs. 4a, 4b, in a particular embodiment, the engaging  
11 means 16 is a bracket 16b comprising a connecting member 40, for connection to  
12 the tension means 17, and a base 41. The base 41 has support members 42 which  
13 extend laterally from the connecting member 40. As shown and adapted to a cover  
14 having two planer surfaces, the support members 42 extend bi-laterally from each  
15 side of the connecting member 40, forming an upside down "T"-shape. The  
16 peripheral edges 21a,21b of the cover 10 are supported on the support members 42.  
17 The connecting member 40 has a port 43 for accepting a flexible tension means 17.  
18 Preferably, the bracket 16b is manufactured of UV resistant plastic polyurethane.

19 As shown in Fig. 5, the tension means 17 can comprise a strap 50  
20 which connects about the crossbar 18 and aligns co-linearly with the connection  
21 member 40 through port 43 of the engaging means 16. The base 41 is preferably  
22 contoured to ensure or ease engagement of the peripheral edges 21a,21b with the  
23 support members 42,42. Distal ends 44 of the support members 42 are chamfered

1 (not shown), or are bent away (shown) from the cover and crossbar 18 so as to  
2 minimize interference with the peripheral edge 21a of the cover 10 during the folding  
3 over process. Other embodiments of the engaging means 16 are shown in Figs. 9a-  
4 9c. In Fig. 9a, distal ends 44 of the bracket 16b are not bent away. In Fig. 9b, the  
5 base 41 has one bent away distal end 44, and in Fig. 9c, each distal end 44 of the  
6 base 41 is bent away.

7 In another embodiment, shown in Fig. 6, the tension means 17 or  
8 engaging means 16 are restrained from being accidentally displaced prior to and  
9 during use through an optional releasable connector 54 to one of the planer surfaces  
10 19a,19b. Such a releasable connector 54 is a hook and loop fastener.

11 Preferably, the tension means 17 is a strap 50 having a first end 51  
12 which connects around the crossbar 18 and a second end 52 which connects to the  
13 port 43 in the engaging means 16. For adjusting the length of the strap 50 and thus  
14 adjusting the relative position of the hinge 20 and the crossbar 18, means such as a  
15 buckle 53 is positioned intermediate the ends 51,52. The buckle enables adjustment  
16 of the length of the strap 50 so as to adjust for an aged or relaxed strap 50 or so that  
17 the same apparatus can be utilized for covers 10 of different size.

18 The tension means 17 (such as straps 50) and engaging means 16  
19 (such as brackets 16b) can be provided as a kit to retrofit existing covers and cover  
20 lifters before the cover 10 is damaged or as a new component for use with new  
21 lifters and spas.

22 Turning to Figs. 7a-7d, several alternate embodiments are illustrated.  
23 At least one engaging means 16 is illustrated in each embodiment. Further, at least

1 one tension means 17 is provided, numbering at least one per engaging means 16.  
2 Two or more tension means 17 are spaced along the crossbar 18 for distributing the  
3 load therealong. In Fig. 7a, the tension means 17 and engaging means 16 include  
4 two pairs of tension 17,17 and engaging means 16,16 spaced along the crossbar 18  
5 and are similar to the embodiment set forth in Figs 2a-2e. In Fig. 7b, two tension  
6 means 17,17 extend diagonally to a single engaging means 16. In Fig. 7c a netting  
7 or mesh-style tension means 17 (with alternate mesh styles shown) transfers tension  
8 from one or more engaging means 16,16... . In Fig. 7d, two pairs of tension means  
9 17,17 and engaging means 16,16 are positioned at distal ends of the crossbar 18  
10 and transverse edges of the cover for positioning the engaging means at the  
11 transverse edges of the peripheral sides 21a or 21b of the cover 10.

12 In Figs. 8a and 8b, a prior art arrangement of a single planer surface  
13 cover 10 is illustrated with a loop 55 or sleeve type fabric support acting as a means  
14 for hanging the cover from a crossbar 18. The loop 55 and its connection to the  
15 cover are under significant stress.

16 As shown in Fig. 8c, applying an embodiment of the present invention,  
17 the cover is supported using an engaging means 16 and tension means 17 with the  
18 result that the loop 55 is under little or no stress when the cover is supported.  
19 Preferably the tension means 17 is positioned at the distal ends of the crossbar 18  
20 (such as in the embodiment of Fig. 7d) or extends through the cover for connection  
21 to the crossbar 18.

22 Stress is removed from the stitching in the spa cover hinge by  
23 providing support to a cover or to both sides of a folding cover through tension

1 means which extend to engage the cover from below and thereby enabling support  
2 of the weight of the cover in compression and not through tension to the cover,  
3 thereby increasing the life expectancy of the spa cover. This apparatus is simple  
4 and easy to use. The apparatus is also non-invasive to the spa, or the spa cover.  
5 The straps and brackets are easy to install, low cost, adjustable and can be used  
6 with existing lifting devices incorporating a crossbar and side arms.